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GLOSSARY OF WATER RESOURCE TERMS

FEDERATION WATER POLLUTION CONTROL ADMINISTRATION

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glossary of water resource terms

CLEAN WATER

U S DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN
33 E CONGRESS PKWY, CHICAGO, ILLINOIS

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The rapidly developing field of water pollution control already has stimulated its own special language through origination of new terminology and popularization of other vocabulary formerly reserved for highly technical study. Understanding of this language is necessary for all those wishing to participate both in scientific inquiries and social action designed to solve the world-wide crisis of water pollution today.

To help meet this need, the Federal Water Pollution Control Administration of the United States Department of the Interior, in cooperation with the Open Lands Project of Chicago, Illinois, a private conservation and environmental planning organization, has published the following glossary of water pollution control terminology.

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INTRODUCTION

Language is the essential building block of both knowledge and action. Thus, for each new field of human activity, a new language must be developed as the basis of creative thought, shared understanding and joint action.

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FWPCA and the Open Lands Project are grateful to Mrs. Olga Adler Titelbaum of Chicago, Illinois, who prepared the original manuscript for this glossary.

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Olga Adler Titelbaum

Chicago, Illinois, April 1970

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GLOSSARY OF WATER RESOURCE TERMS

ABS	See alkyl benzene sulfonate.
accelerated depreciation	In pollution abatement, an arrangement whereby, as an incentive to industry to install pollution abatement equipment, a company is allowed to deduct from its taxable income the entire cost of such equipment over a shorter period of time (perhaps only one to three years) than in the case of other types of capital investment.
acidity	The capacity of a substance to donate protons. Acids contribute to the corrosiveness of water.
acre-foot (of water)	A quantity of water that would cover 1 acre to a depth of 1 foot, that is 43,560 cubic feet, or 325,850 gallons.
activated-carbon filter	A filter used to remove dissolved organic matter from water.
adsorption	A taking up of gases or liquids by the surfaces of solids or liquids with which they are in contact.
aeration	The process or state of being supplied or impregnated with air; in waste treatment, a process in which liquid from the primary clarifier is mixed with compressed air and with biologically active sludge.
aerobic	Living or taking place only in the presence of molecular oxygen.
affluent	Tributary.
algae	Largely aquatic nonvascular plants that grow in either sea water or fresh water; seaweeds and pond scum are algae.
algicide	A chemical (such as copper sulfate) used to kill or inhibit the growth of algae.
alkalinity	The capacity of a substance to accept protons. Natural waters are generally neutral or slightly alkaline. The alkalinity of water may range from a few milligrams per liter to several hundred. Domestic sewage is usually slightly more alkaline than the water from which it is derived.

alkyl benzene sulfonate (ABS)	A chemical surface-active agent used in synthetic detergents that causes foaming; its compounds to not readily decompose biologically through bacterial action.
alum	A chemical substance (usually potassium aluminum sulfate), gelatinous when wet, used in water-treatment plants for settling out small particles of foreign matter.
anadromous fish	Fish that go up-river to spawn (for example, salmon, shad).
anaerobic	Living or taking place in the absence of molecular oxygen.
anaerobic contact process	A waste-treatment process similar to the activated sludge process; it is largely one of contact in the absence of free oxygen between living organisms and sludge, in which the organisms digest the organic matter in the sludge.
anticline	Arch or crest of a fold in rock strata. (Compare syncline.)
antagonism, pollution	The combined effect of two or more toxic substances acting together that is less adverse than their sum would be if each were acting separately or independently. (Compare synergism, pollution.)
aquatic plants	Plants that grow and live in water; they may be floating, submerged, or emergent.
aquifer	A porous layer of rock that carries a usable supply of water. Gravel, sand, sandstone, and limestone are the best water aarriers; clay, shale, and crystalline rocks are poor water carriers.
artesian aquifer	An aquifer that carries water under pressure.
artesian spring (artesian well)	A spring (well) in which confined groundwater under pressure has a natural outlet.

articulation (of a water body)	The ratio of area of inlets and bays to the total area of the water body.
avulsion	Marked changes in the shore of a water body or the course of a stream (such as may result from wave erosion) involving extensive removal and redeposition of soil; such changes affect riparian property rights and raise legal questions concerning property lines and ownership of the transported and redeposited material.
bar screen	In a waste-treatment plant, a screen that removes large suspended solids.
barminutor	See comminutor.
base flow	The part of stream flow contributed by groundwater which seeps into the surface streams.
baselevel	The lowest level to which a stream can wear its bed. Permanent baselevel is the level of the sea.
basin	A region in which the strata or layers of rock dip in all directions toward a central point. Thus, it is any hollow or trough in the earth's crust, whether filled by water or not. A river basin is the total area drained by a river and its tributaries.
bedding	The arrangement of rocks in layers or strata.
bedrock	The solid rock beneath the loose material (soil and subsoil) with which most of the land surface of the earth is covered. It is sometimes several hundred feet beneath the surface, but is usually found at a much smaller depth; in places, especially on steep slopes, it has no soil cover at all.
benefit-cost analysis	Economic analysis of a resource development project, taking into account both known and projected factors with a view to discovering the relative efficiency of the project.
benthic	Relating to the bottom underlying a body of water (for example, mud-dwelling mollusks are benthic organisms).

benthic macroorganism	An organism associated with the bottom material of a lake or stream, or with sludge and deposits in a trickling filter, large enough to be retained by a relatively coarse-mesh screen (No. 30 sieve, having openings of 0.589 mm.).
benthic microorganism	A bottom-dwelling organism small enough so that it will be retained only by a relatively fine-mesh screen (No. 100, having openings of 0.149 mm.).
bgd	Billion gallons per day.
biodegradable detergent	See detergent, biodegradable.
biota	Living things; the plant and animal life of a region.
bloom	The excessive growth of algae in a body of water due to an oversupply of dissolved nutrients; it may impart a disagreeable odor to the water, cause fish to die, and impair the use of the water for drinking or recreation. (See eutrophication.)
BOD	See oxygen demand, biochemical.
bog	An area of soft, wet, spongy ground consisting chiefly of decayed or decaying moss and other vegetable matter. It often forms in shallow, stagnant lakes or ponds, and is largely produced by sphagnum moss, from which eventually peat is evolved. Bogs may also be formed on cold, damp mountain surfaces. (Compare swamp.).
brackish water	Water containing more than 1,000 ppm of dissolved solids.
breakwater	A natural or artificial barrier that serves to break the force of waves and thereby shelters craft in a harbor or protects a beach from erosion.
canal	An artificial watercourse cut to facilitate transportation, drainage, or irrigation.
canal, ship	A canal deep enough and wide enough to permit the passage of ocean-going vessels.

carbonizing	In wool manufacture, the process of removing vegtable matter (e.g., straw, burs, grass) by steeping the wool for a short time in a dilute sulfuric acid solution, drying at high temperature, then brushing it out by a beater.
catch basin (gravity separator)	A cistern situated at a point where waste water discharges into a sewer, to catch and retain matter that would not pass readily through the sewer; a reservoir or well into which surface water may drain.
catchment basin	See watershed.
causeway	A raised way or road across wet or marshy ground, across the surface of a water body, or from a shore to an island.
cesspool	An underground structure designed to hold sewage from a residence; the waste is permitted to percolate from the cesspool into the surrounding soil.
cfs	Cubic feet per second; a measure of discharge -- the amount of water passing a given point.
channel	The water-filled groove through which runoff water flows. In a narrow valley the channel may include the entire valley floor, but ordinarily it occupies only a small fraction of the valley.
chlorination	The application of chlorine or a hypochlorite to water for purposes of disinfection, oxidation of organic matter, or retardation of putrefaction.
chlorine-contact chamber	In a waste-treatment plant, a chamber in which effluent is disinfected with chlorine before it is discharged to the receiving waters.
chlorine demand	The difference between the amount of chlorine applied to a treated supply and the amount of free, combined, or total available chlorine remaining at the end of the contact period. The chlorine demand is determined by the amount of oxidizable material present in the water.

clarifier	In a waste-treatment plant, a basin or tank in which solids float to the surface or settle to the bottom by gravity.
coagulation	In water treatment, the introduction of sulfate of alumina into polluted water; this causes organic matter to form a mass that entangles or entraps all particulate matter in the water, thereby increasing the rate of sedimentation.
COD	See oxygen demand, chemical.
coliform (coliform bacterium)	Any of a number of organisms common to the intestinal tract of man and animals, whose presence in waste water is an indicator of pollution.
coliform index (coli index)	An index of the purity of water based on a count of its coliform bacteria.
collecting sewer	See sewer, collecting.
colloidal matter	In waste water, fine suspended particles that will not settle out except very slowly, and hence require special treatment such as sedimentation with coagulants, or dialysis.
colon bacillus	See coliform.
combined sewer	See sewer, combined.
comminutor	In a waste-treatment plant, a device that grinds solids to make them easier to treat.
comprehensive development	The basin-wide development of water and land resources for optimum beneficial uses of a river system and its watershed.
condensation	The process by which a substance changes from the vapor to the liquid state. The opposite process is evaporation.
cone of depression	The area around a well from which water is pumped, where the water table has been lowered by the pumping.
confluence	The point at which one stream flows into another or where two streams converge and unite.

confluent	A tributary; a stream that joins another.
connate water	Water imprisoned in sedimentary rocks at the time of their formation and held there; sometimes called fossil water.
conservation	Managed human ecology whereby man achieves an optimum relationship with the resources in his natural environment. It embraces both preservation and wise use of natural resources.
consumptive use (of water)	Water use resulting in a large proportion of loss to the atmosphere by evapotranspiration (as in irrigation), or by combination with a manufactured product.
contour line	An ideal line connecting all points at which the elevation is equal.
contouring	Plowing and planting land across a slope, rather than up and down hill, in order to control erosion.
conventional wastewater treatment	See wastewater treatment, conventional.
cooling water	Water used for cooling in an industrial or manufacturing process; since its temperature after use is normally higher than that of the lake or stream into which it is discharged, it may constitute a source of thermal pollution.
cooling water load	The energy in the form of heat dissipated by cooling water.
coppering	The treatment of water with a copper compound to prevent algal growths that cause noxious taste and odor.
cost-benefit analysis	See benefit-cost analysis.
coulee	An intermittent stream; a dry creek bed that may run in a wet season; a steep-walled valley or ravine, often having a stream at the bottom.
critical streamflow	The amount of water available for the generation of water power during the most adverse streamflow period.

crossbedding	The disposition of rocks in layers with minor strata lying oblique to the main strata.
currents	Movements or flows of water, set in motion by winds and waves or by differences in temperature.
dam	An artificial barrier for impounding water or sediment; a natural barrier created by the lodgment of driftwood across a stream channel, by alluvial deposition, by a landslide, or by the work of beavers.
dam, dry	A retarding structure in the headwater area of a stream, designed for flash flood control; no permanent storage of water is involved, and the area can be farmed or grazed between flood periods.
dam, filter	A pervious barrier of loose stones, or stones and brush, placed in the outlet of a water body to prevent fish from moving out or in the inlet of a water body to prevent fish from entering.
dead reservoir storage	The volume of water in a reservoir below the lowest outlet or operating level.
depletion (water)	The portion of water supply withdrawn or intercepted that is used consumptively.
depression storage	The water contained in minor natural depressions in the land surface, such as puddles.
desalination	Total or partial removal of salt from salt water.
dessication	Loss of water by direct evaporation, by drainage or dredging, by escape of water through subterranean outlets, by a drop in the groundwater level, or by the removal or destruction of a dam.
detergent	Any of a large number of synthetic water-soluble or liquid surface-active agents for use in washing; like soaps, they emulsify oils and hold dirt in suspension; to the extent that they are not biodegradable, they create long-term pollution problem.
detergent, biodegradable	One that decomposes quickly as a result of the action of organisms, eliminating foam in waste water. Biodegradable is defined as having at least 90 percent surfactant reduction, or as having surfactant concentration no higher than 0.5 mg/l.

dew point	The temperature at which the atmosphere, being cooled, becomes saturated with water vapor; by condensation the water vapor is deposited as drops of dew.
dialysis	See electrodialysis.
diatomaceous earth (diatomite)	A fine inert siliceous material resembling chalk, through which effluent is filtered in a sewage treatment plant to remove solids.
digester	In a waste-treatment plant, a closed tank that decreases the volume of solids and stabilizes raw sludge by bacterial action into a material that can be disposed of.
dike	An artificial embankment constructed to hold a body of water so as to prevent flooding of the adjoining land or to prevent inflow into the water body of undesirable water.
diluent	A diluting agent.
dilution ratio (dilution factor)	The ratio of the water of a stream to the incoming waste; the capacity of a stream to assimilate waste is partially dependent upon the dilution ratio; in a waste-treatment plant design, the dilution ratio is the ratio of the maximum waste flow actually treated to the dry weather flow of the plant.
discharge	The volume of water that passes through a given cross-section of a channel during a unit of time. This flow, measured in cubic feet per second, is the amount of water fed to the stream from surface and groundwater runoff. Discharge varies according to velocity of flow, which in turn depends upon gradient (downstream slope, usually expressed in feet per mile), volume of water, load of rock particles being carried, shape of the channel, and cross-sectional area of the channel.
dissolved oxygen (DO)	The oxygen freely available in water. In unpolluted water, oxygen is usually present in amounts of 10 ppm or less. Adequate dissolved oxygen is necessary for the life of fish and other aquatic organisms. About 3-5 ppm is the lowest limit for support of fish life over a long period of time.

dissolved solids (DS)	The total amount of dissolved material, organic and inorganic, contained in water or wastes. Excessive dissolved solids can make water unsuitable for industrial uses, unpalatable for drinking, and even cathartic. Potable water supplies may have dissolved solid content from 20 to 1000 mg/l, but sources which have more than 500 mg/l are not recommended by the U.S. Public Health Service.
diversion	The taking of water from a water body by way of a canal, pipe, or other conduit.
divide (drainage divide)	The boundary between one drainage basin and another; the line separating two watersheds.
DO	See dissolved oxygen.
doctrine of appropriation (priority of rights)	The doctrine that whoever puts water to a beneficial use may continue to take it so long as the use does not conflict with use by someone with an earlier claim to the same source: "First in time, first in right." In the seventeen western states this doctrine applies either exclusively or as a hybrid appropration-riparian right doctrine.
domestic use (of water)	Water use in homes and on lawns, including use for laundry, washing cars, cooling, and swimming pools.
drainage area (drainage basin)	See watershed.
drainage divide	See divide.
draw	A tributary valley or coulee, that usually discharges water only after a rainstorm.
drawdown	The lowering of the water level in a well and in the adjacent water table as a result of withdrawal by pumping; a drop in the water level of a reservoir.
dry farming	A method of farming without irrigation in an area of limited rainfall, the land being treated so as to conserve the moisture it contains.
dry lake	The site of a former lake, which need not be literally dry, but may support marsh or even aquatic vegetation.

dry-weather flow	The rate at which waste water flows through sewage treatment plants during periods when no storm run-off enters the sewers.
DS	See dissolved solids.
dystrophic	(Of a lake) brownish, with much dissolved humus matter, a small bottom fauna, and a notably high oxygen consumption.
effluent	A substance that flows out; an outflowing branch of a stream or lake; the liquid that flows out of a waste-treatment plant.
effluent charge	A water fee set to compensate downstream water users for all damages caused by an upstream user's polluting discharge.
electrodialysis	A process whereby water flows through an electrically-charged stack of ion-permeable membranes; mineral salts separate into positive and negative ions that migrate through the membranes, leaving the water behind.
emergent (emersed) aquatic plants	Rooted plants, such as the bulrush and cattail, that grow in shallow water with a portion of their stems and leaves rising above the water surface.
enteric virus	Any virus known to be excreted in quantity in feces; infectious hepatitis virus is such a virus.
ephemeral stream	See intermittent stream.
erosion	The wearing away of land surface by various natural agencies, the most important being water, in the form of seas, rivers, rain, glacial ice, hoarfrost, and melting snow.
estuary	The mouth of a river, where tidal effects are evident and where fresh water and sea water mix.
eutrophic	(Of a lake) rich in dissolved nutrients, but frequently shallow and with seasonal oxygen deficiency below a certain level.

eutrophication	The normally slow aging process by which a lake evolves into marsh and ultimately becomes completely filled with detritus and disappears. In the course of this process the lake becomes overly rich in dissolved nutrients (for example, nitrogen and phosphorus), so that an excessive development of algae results. First the water becomes murky, then noxious odors and unsightly scums appear. In the lower layers dissolved oxygen levels become depressed, and bottom-dwelling fauna change from clean-water forms to pollution-tolerant forms.
evaporation	The process by which a substance changes from the liquid to the gas or vapor state. The opposite process is condensation.
evapotranspiration	Water loss through evaporation (from soil and surface water bodies) and transpiration (from plants).
exotic stream	A perennial stream that flows through a desert region but has its source in an area outside the desert. Typically it loses volume through evaporation and seepage, and has few or no tributaries as it crosses the desert. Examples include the Nile and the Colorado.
extinction, lake	The gradual permanent loss of the water or water surface of a lake by the encroachment of vegetation, transforming the lake into a bog, marsh, or swamp.
farm pond	A shallow structure for the impoundment of water to meet agricultural needs, such as irrigation, stock watering, spraying, and fire protection; the pond site may be a natural depression deepened to store surface runoff or utilize groundwater, or it may be created by building a dam on a small stream; it may be temporary or permanent, and may provide collateral recreational benefits such as fishing, boating, bathing, wildlife habitat, picnicking, and aesthetic values.
fault	A fracture in the earth's crust along which movement has taken place and where the rock strata on the two sides therefore do not match.
fault plane	A surface along which a fault has taken place.

fertile water body	A water body that has a prolific growth of aquatic plants and an abundance of aquatic fauna; extreme acidity, alkalinity, salinity, or the presence of toxic matter may interfere with the population of a water body.
filter-press cake	A residual waste product (as, for example, from the process of grease recovery following the wool scouring process); filter-press cake may contain organic matter, dirt, grit, or other residue.
filtration	In waste treatment, the mechanical process that removes particulate matter by separating water from solid material, usually by passing it through sand.
finger lake	A long narrow glacial lake.
fish kill	The destruction of fish in a water body -- in winter, due to prolonged ice and snow cover or freezing of the water; in summer, due to oxygen dificiency resulting from excessive organic matter; in any season, due to toxic pollutants or disease.
fish ladder	A device to facilitate the movement of migrating fish over a dam; it may consist of a stairlike series of small ponds connected by flowing water.
floating matter (in waste water)	Froth, oil, and floating solids. Froth results from detergent cleaning, certain mineral flotation processes, pulp and paper manufacture, and municipal sewage. Oil results from chemical processes, refining, machinery lubrication, and metalworking. Floating solids can be pulp or textile fibers, fine coke, food pulps, bark, or sawdust.
flocculation	In wastewater treatment, a process that causes aggregation or coalescence of solid matter into small lumps or loose clusters.
flood	Any stream flow that greatly exceeds the average stream flow, whether or not it overtops the channel banks.
flood, annual	The maximum daily flow during 12 consecutive months, that is, the highest daily flood peak for a year of record.

flood, average annual	The mean of the annual floods during a period of record.
flood, flash	A sudden and violent flood after a heavy rain.
flood crest	The highest elevation reached by flood waters in a flood event. It is commonly measured in feet above an accepted datum, such as flood stage.
flood damage	Economic loss caused by flood, including inundation, erosion, and sediment deposition; the loss may be evaluated in terms of cost of replacement, repair, or rehabilitation; decrease in market or sales value; or resulting decrease in income or production.
flood event	A series of flows constituting a distinct progressive rise culminating in a crest, together with the recession that follows the crest.
flood peak, daily	The maximum flow on any one day during a flood event.
flood peak, momentary	The maximum rate of flow during a flood event; usually this is the flow at the time flood crest is reached.
flood plain	The lowland that borders a river, usually dry but subject to flooding when the stream overflows its banks.
flood stage	That elevation of the water surface (selected by local usage or by an investigator) above which the stream is considered to be in flood. Commonly it is the stage at which damage begins.
flotation	In waste treatment, the collection of substances immersed in waste water by taking advantage of differences in specific gravities, or else by entrapment of solid particles with air causing them to rise to the surface for subsequent disposal.
flowmeter	In a wastewater treatment plant, a meter that indicates the rate at which waste water is flowing through the plant.

flume	A ravine or gorge with a stream running through it; an inclined channel for conveying water for various uses (for example, irrigation); a channel placed in a stream of water to measure the volume or rate of flow.
fluoride formation	A chemical that in concentration of approximately 1.0 mg/l is a preventive of tooth decay. Fluoride may occur naturally in water, or may be added in controlled amounts. Waters that contain excessive fluoride require defluoridation to reduce the fluoride content to an acceptable level.
fold	A bend in rock strata caused by movements of the earth's crust. When the compression is relatively small, the strata are forced into a series of arches and troughs. (See anticline and syncline.)
force main	A pipe in which waste water is carried under pressure.
formation	A unit of rocks, readily identified and mapped, usually consisting of the same kind of rock and implying the same environment of deposition.
fulling	In wool manufacture, a finishing process whereby piece goods are soaked in a soap solution and put through a series of roller mills until they have become felted and shrunken to increase their body and density.
funnel access	A small parcel of riparian land deeded collectively to a group of land owners who have no frontage bordering the water, so as to give them legal access to the water.
geyser	A thermal spring that erupts intermittently.
grass waterway	An area of grass over which runoff water can move in a thin sheet across the land surface and thus proceed more slowly than it does when it moves across cultivated crops, hence causing less erosion.
gravity separator	See catch basin.
gridding (of water)	Distribution of water by pipeline. On a regional basis this may be done so as to achieve a more efficient adjustment between supply and demand than is found in nature.

grit-removal chamber	In a waste-treatment plant, a chamber used for settling out stones, cinders, and sand.
groundwater	Water in the pores and crevices of the earth's mantle rock which has entered them chiefly as rain water percolating down from the surface -- as opposed to the rain water which runs off in streams; all water below the water table.
gully erosion	The widening, deepening, and cutting back of small channels and waterways due to erosion.
hardness (of water)	A measure of the calcium and magnesium salts present in water. Soft water is that with less than 60 parts of salts to the million (ppm); temporary water is that with 60 to 120 ppm of salts; permanent water is that with salts in excess of 120 ppm. (Other salts that may occur in water include those of iron, aluminum, manganese, strontium, zinc.)
head of navigation	The farthest point up a river to be reached by vessels for the purpose of trade.
headrace	The pipe or chute by which water falls into the turbine of a power plant.
herbicide	An agent (usually a chemical) used to destory or inhibit vegetation; a selective weed killer that does not injure crop plants.
hexane solubles	Fats, oils, greases.
hot spring	See thermal spring.
house sewer connection	The sewer that connects a house to the sewer in the adjacent street.
humus	Organic matter in or on a soil, composed of partly or fully decomposed bits of plant or animal matter.
hydrogen-ion concentration	see pH.
hydrologic cycle	The continual exchange of moisture between the earth and the atmosphere, consisting of evaporation, condensation, precipitation (rain or snow), stream runoff, absorption into the soil, evaporation, condensation, precipitation, etc.

hydrology	The science of the behavior of water in the atmosphere on the earth's surface, and underground.
hydrolysis	The chemical reaction of water with another substance in which hydrogen and hydroxyl are added to the other substance, forming usually two or more new compounds.
hydrophytes	Plants that grow only in water or very wet earth.
hypertrophic water	Water of high nutrient content.
impermeable rock (impervious rock)	Rock which, being non-porous (for example, unfissured granite) or practically so (for example, clay), does not allow water to soak into it or pass through it freely; non-porous rock may be pervious, however, owing to joints and fissures.
impoundment	A body of water, such as a farm or ranch pond, formed by confining and storing the water (for example, by a gully-control structure or a highway-fill dam).
infiltration	The flow of a fluid into a substance through pores or small openings. The common use of the word in hydrology is to denote the flow of water into soil material.
influent water	Water contributing to the zone of saturation and thereby sustaining or raising the water table.
integrated woolen mill	One in which all functions of wool processing are carried out from beginning to end: opening and scouring, spinning, dyeing, and finishing.
intercepting sewer	See sewer, intercepting.
interfluve	The ridge between two adjacent river valleys.
interior drainage	See internal drainage.
intermediate treatment	Waste-water treatment such as aeration or chemical treatment, supplementary to primary treatment. Such treatment removes substantial percentages of very finely divided particulate matter, in addition to the suspended solids removed by primary treatment. Supplementary processing improves the efficiency of treatment so that about 60 percent of both BOD and suspended solids are removed.

intermittent stream	One that carries water runoff only in times of rainfall and remains as a dry channel during the rest of the year.
internal drainage	Drainage in which the waters have no outlet and so do not reach the sea.
interstices	The openings or pore spaces in rock; in an aquifer, they are filled with water.
investment tax credit	In pollution abatement, reduction in a company's tax by a given percent of the sum invested in pollution abatement equipment and facilities.
iron bacteria	Bacteria that either utilize iron as a source of energy or cause its dissolution or deposition. The former obtain energy by oxidizing ferrous iron to ferric iron, which is precipitated as ferric hydrate; the latter, without oxidizing ferrous iron, alter environmental conditions in such a way as to cause it to be dissolved or deposited.
irrigation	The artificial distribution of water on the land in order to (1) facilitate the cultivation of crops where otherwise, owing to a deficiency of rainfall, agriculture would be impossible or difficult, or (2) increase or enhance the yield in areas where rainfall is adequate but supplementary distribution of water at certain critical periods in the development of the crop is advantageous.
joint	A crack formed along a plane of weakness (joint plane) in a mass of rock; it is unlike a fault in that little or no movement has taken place between the blocks.
kier	A vat in which fibers, yarns, and fabrics are boiled, bleached, or dyed.
lacustrine	Relating to a lake.
LAS	See linear alkylate sulfonate.
lateral sewer	See sewer, lateral.
leaching	The process by which the more soluble material, such as organic and mineral salts, is washed out of a layer of soil into a lower layer by percolating rain water.

levee	The natural bank of a river formed during flooding by the deposition of silt. The natural levee is thus the highest portion of the flood plain of a river. Artificial levees may be constructed along the river banks to keep the water of a river within its proper channel.
lignin	A woody plant substance often discharged as a waste during the manufacture of paper pulp.
limnology	The study of the physical, chemical, meteorological, and biological conditions in fresh waters (especially ponds and lakes).
linear alkylate sulfonate (LAS)	A surface-active compound in synthetic detergents that decomposes readily by bacterial action where oxygen is present.
littoral	The shallow waters that extend along the edge of a lake or sea.
load, river	The solid matter carried along by a river, including dissolved material, suspended material (mainly mud, silt, and sand), and the larger, heavier material carried along the river bed. The maximum or full load of a river depends on its velocity and volume, and on the size of the particles constituting the load. When the limit of the possible load has been reached, any further addition involves the dropping of an equivalent portion of the original load.
long profile	See profile, river.
low stream-flow augmentation	The release of water from dam-controlled reservoirs when stream level is low.
mantlerock	The layer of loose rock fragments, the surface part of which is called soil, that covers most of the earth's land area and varies in thickness from place to place.
marsh	A tract of soft, wet land, usually low-lying and partly or completely under water; the extreme dampness is due to the impermeable nature of the soil (such as clay) and the poor drainage. (Compare swamp.)

maximum capacity — In waste-treatment plants, either the maximum rate at which waste water can be put through a plant hydraulically, or some lower rate established by the management (such as the maximum rate at which waste water can be treated without seriously interrupting the treatment process).

meander — One of the curves in a river course that swings from side to side in wide loops as it progresses across flat country. A meander is continually being accentuated by the river itself, the concave bank being worn away by the current while solid material is being deposited at the convex bank.

mechanical screen — See bar screen.

mgd — Million gallons per day.

mg/l — Milligrams per liter.

mill pond — A relatively small impoundment, usually behind a man-made dam, used to supply power to operate a mill.

mill scale — In steel manufacture, the film of scale that results when the surface of steel oxidizes during heating. This scale must be removed from the metal before it is rolled. It is generally removed by directing a high-pressure water spray onto the metal surface immediately ahead of the rolls; the scale drops into a flume and is carried by a stream of water to a scale-recovery pit where it settles to the bottom; any remaining scale can be trapped by baffles at the outlet.

mining — The depletion of a resource without making any provision for replenishment.

monocline — A fold in rock strata in only one direction; the incline may be in the direction of becoming steeper or more gentle.

muck — The usually blackish, fine-textured, and largely organic deposits at the bottom of a water body.

multiple use	The management of land and water resources taking into account the many human demands on them with a view to all necessary and desirable uses; these demands change in nature and number through time.
multiple-purpose development	In water projects, development that takes into account the use and control of water in all possible aspects: irrigation, power, flood control, domestic and industrial water supply, pollution control, navigation, recreation, fish and wildlife. The first multiple-purpose project authorized and designed as such was the Boulder Canyon Project (Hoover Dam), 1928.
natural resource	A resource such as air, climate, fish, minerals, scenic beauty, soil, sunshine, vegetation, water, wildlife. Some natural resources have a market value (for example, timber), others have a "non-economic" value (for example, scenic beauty).
neuston	The community of minute organisms living in the surface film of water.
nitrogenous wastes	Wastes of animal or plant origin that contain a significant concentration of nitrogen.
nonconsumptive use (of water)	Water use in which only a small portion is lost to the atmosphere by evapotranspiration or by being combined with a manufactured product. Nonconsumptive use returns to the stream or ground approximately the same amount of water as is diverted or used.
nutrient	A chemical substance (an element or an inorganic compound, e.g., nitrogen or phosphate) absorbed by a green plant and used in organic synthesis.
oligotrophic	(Of a lake) weak in production of plant life and typically very clean and clear; in the past the Great Lakes have been oligotrophic.
on-site use (of water)	Chiefly (1) water-oriented recreation (such as swimming, fishing, water-skiing, diving, boating, water-fowl hunting, as well as picnicking, walking, and driving), which requires the presence of water, or (2) flood control facilities, which require space or empty capacity to accommodate water.

opening	In wool manufacture, the gentle mechanical separation of fibers to remove sand, grit, grass, and other foreign materials.
osmosis	The flow or diffusion through a semipermeable membrane separating unlike substances in the course of which the concentrations of the components on the two sides of the membrane are equalized; especially the passage of solvent (usually water), in distinction from the passage of solute.
outfall sewer	See sewer, outfall.
over-enrichment	See eutrophication.
owf	"On the weight of the fiber" -- in the textile industry, a basis for calculating the polluting characteristics of different operations and different fibers.
oxbow lake	A lake formed when a meandering river, having bent in almost a complete circle, cuts across the narrow neck of land between the two stretches and leaves a backwater; silt is gradually deposited by the river at the entrance to this backwater till it is finally separated from the river and becomes a lake.
oxygen demand, biochemical (oxygen-depleting effect; BOD)	The amount of oxygen required for aerobic bacteria to oxidize completely the organic decomposable matter in water within a specified time and at a given temperature--an index to the degree of organic pollution in the water. When discharged to a watercourse, waste containing BOD constituents will consume dissolved oxygen in the water; the BOD indicates the rate at which the oxygen is used up. Waters that receive high BOD waste undergo reduction of oxygen and consequent damage to aquatic life.
oxygen demand, chemical (COD)	The amount of oxygen required to oxidize completely the inorganic oxidizable compounds present.
oxygenation	Impregnation or combination with oxygen.
package plant	A prefabricated or prebuilt wastewater treatment plant.

parent material	The disintegrated rock material that underlies and generally gives rise to soil.
parshall (parshall flume)	A device for measuring the flow in conduits by observing the difference in pressure on opposite sides of a partial obstruction.
pathogenic	Causing or capable of causing disease.
pc/l	Picocuries per liter.
PE	See population equivalent.
percability	Permeability.
perched water body	A suspended, isolated body of groundwater occurring in a saturated zone, separated from the main body of groundwater by unsaturated, impermeable rock. The isolated body has its own local water table--a perched water table--below which shallow wells can obtain water.
percolation	The movement of water through the pores or interstices of a rock or soil.
percolation, deep	The water that passes below the root zone of vegetation.
perennial stream	One that carries water all through the year.
periphyton	Organisms (including both plants and animals) that commonly grow on submerged surfaces such as stones, wood, aquatic plants, or other objects, forming more or less continuous slimy or woolly felted coatings on these objects.
permeable rock (pervious rock)	Rock, either porous (such as sandstone) or fissured, that allows water to soak into it and pass through it freely.
permeability	The capacity of rock or mantle to permit water to pass through it. This depends on the volume of the openings and pores, and also on how these openings are connected one to another. In porous rocks it varies roughly as the square of the diameter of the particles of the material.

pesticide	An agent (usually a chemical) used to destroy pests. Pesticides present in ground and surface waters as a result of direct application, runoff, percolation, or manufacturing discharge may have grave adverse effects on water quality. Careless use of pesticides may result in fish kills.
pH	Hydrogen ion concentration which reflects the balance between acids and alkalies. The extreme readings are 0 and 14. The pH of most natural waters falls within the range 4 to 9. A pH of 7.0 indicates neutral water. A 6.5 reading is slightly acid; an 8.5 reading is alkaline. Slight decrease in pH may greatly increase the toxicity of substances such as cyanides, sulfides, and most metals. Slight increase may greatly increase the toxicity of pollutants such as ammonia. Alkaline water will tend to form a scale; acid water is corrosive; good water should be nearly neutral.
phenol	Carbolic acid, an acidic compound that is a powerful caustic poison.
photic zone	The upper zone of a body of water in which sufficient light is available for photosynthesis. (Compare profundal zone.)
pickle liquor	In steel manufacture, a dilute acid solution used to clean steel.
pickling	The process of immersing hot steel in a bath of hot dilute acid to prepare it for being cold-rolled and finished by galvanizing and tin-plating.
picocurie	A unit of radioactive disintegration; 1 picocurie = 10^{-12} curie = 2.22 disintegrations per minute.
plankton	The floating or weakly swimming plant and animal life of a body of water, consisting mostly of minute forms but including also some larger forms (such as jellyfish) with weak powers of locomotion.
pollutant, refractory	One that resists treatment.

pollution (of water)	Contamination or other alteration of the physical, chemical, or biological properties of water, including changes in temperature, taste, color, or odor of the water, or the discharge into the water of any liquid, gaseous, radioactive, solid, or other substance that may create a nuisance or render such water detrimental or injurious to public health, safety, or welfare. Broadly, pollution means any change in water quality that impairs it for the subsequent user.
pollution, industrial waste	A broad category of wastes from manufacturing operations or processes defined by government as noxious. They include floating matter, settleable solids, colloidal matter, dissolved solids, toxic substances, and sludge.
pollution, natural	Soil, mineral, or bacterial impurities picked up by water from the earth's surface, apart from any human activity.
pollution, sewage	Raw or partially-treated domestic waste.
pollution, thermal	Impairment of water through temperature change due to geothermal, industrial, or other causes.
pollution indicator organism	A plant or animal form, such as the rat-tailed maggot or blue-green algae, that thrives in polluted water.
pondage	The amount of water stored behind a dam of relatively small storage capacity used to control the flow of a river.
population equivalent (PE)	An expression of the relative strength of a waste (usually industrial) in terms of its equivalent in domestic waste, expressed as the population that would produce the equivalent domestic waste. A population equivalent of 160 million persons means the pollutional effect equivalent to raw sewage from 160 million persons; 0.17 pounds BOD (the oxygen demand of untreated wastes from one person) = 1 PE.

porosity	The capacity of rock or soil to contain water. The amount of water that rock can contain depends on the open spaces between the grains or cracks that can fill with water. Well-sorted soil is more porous than poorly-sorted soil. Soil is well sorted if the grains are all about the same size (as in the case of gravel or sand); spaces account for a large proportion of the total volume. Soil is poorly sorted if the grains are not all the same size; spaces between larger grains will fill with small grains instead of with water. Poorly-sorted rock thus holds less water than well-sorted.
potable	Suitable for drinking.
ppm	Parts per million. In water analysis, ppm implies a weight/weight (not a volume/volume) ratio.
precipitation	Any form of water, whether liquid or solid, that falls to the ground from the atmosphere; it includes drizzle, rain, snow, snow pellets, snow grains, ice crystals, ice pellets, and hail; the amount of precipitation is usually expressed in inches of equivalent liquid water depth at a given point over a specified period of time.
pressure filter	A filter in which the pressure on the input side of the filter medium is greater than atmospheric pressure.
primary wastewater treatment	See wastewater treatment, primary.
process water	All water (liquid or vapor) that comes in contact with a product being manufactured.
profile, river	A section or curve showing the slope of a river from its source to its mouth.
profile, soil	A section through the soil showing the different horizons or layers extending downward from the surface to the parent material.
profundal zone	The deep region of a water body that lies below the light-controlled limit of plant growth. (Compare photic zone.)
pumped storage	Water pumped into a storage reservoir during periods of low electric-power demand to be used to generate power during peak demand periods.

pumping station	A station at which waste water is pumped to a higher level. In most sewers pumping is unnecessary; waste water flows by gravity to the treatment plant.
rain shadow	An area that has a relatively light average rainfall due to its situation on the lee side of a range of mountains or hills where it is sheltered from the prevailing rain-bearing winds. On the windward side the rainfall is heavy, owing to the forced ascent of the moisture-laden air; as the air descends on the lee side it is warmed and dried, so that little rain is deposited there.
rainwash	A thin sheet of water flowing evenly downslope, quickly concentrated by converging slopes into the shortest and steepest routes downward. This the first step in the formation of a stream.
rated capacity	The rate of wastewater flow that a treatment plant is considered capable of treating on a continuous basis with proper disposal of sludge and no loss in efficiency.
reaction turbine	A type of water wheel in which water turns the blades of a rotor, which then drives an electrical generator or other machine.
receiving waters	The bodies of water that receive effluent waste water from treatment plants.
recharge area	An area in which an aquifer receives water by force of gravity, usually where a permeable layer lies close to the surface.
recirculating cooling system	In a manufacturing or processing plant, a system that reduces the temperature of used water in a cooling tower by evaporating a small percent of the recirculating stream; although the evaporated water is permanently removed from the supply, overall water withdrawal is reduced to a small percent of what it would otherwise be; discharge of contaminated water may be reduced to as little as 1 percent.
regimen, stream	Fluctuations (usually seasonal) through a norm of the flood-water and low-water states of a stream, with the delicate channel adjustments that accompany these systematic changes.

reservoir	A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.
reservoir, detention or retarding	A basin above a dam, constructed for the temporary storage of stream flow and surface runoff.
reservoir sediment storage	The natural accumulation of sediment in a reservoir that must be taken into account when calculating reservoir capacity.
return flow (irrigation)	That part of irrigation water that is not consumed by evapotranspiration and returns to its source or runs off into another body of water.
"reverse incentive"	In effect, a penalty connected with water use, such as a user charge (based on the amount of water withdrawn from the municipal supply) or an effluent charge (based on the quantity and quality of wastes discharged into a watercourse) to cover damages caused by a user's pollutants.
reverse osmosis	A process in which, if pressure is put on the concentrated side of a liquid system in which liquids with different concentrations of mineral salts are separated by a semipermeable membrane, molecules of pure water pass out of the concentrated solution to the weak or fresh-water side (contrary to the case of normal osmosis).
riparian right	The right of an owner of land bordering on a stream or lake to have access to and use of the shore and water. The use of water is restricted to riparian landowners, and the right is automatic, not created by use nor forfeited through disuse. A riparian water right is not proprietary as is a right to land, but usufructuary--riparian owners enjoy the privilege of using the water without owning it.
river-basin concept	The notion that each river system, from its headwaters to its mouth, is a single unit and should be treated as such. This concept recognizes the interrelationship of resource elements in a single basin, and assumes that multiple-purpose development can take this interrelationship into account. It extends the principle of ecological balance to the whole of the area and its occupants.

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rock	To a hydrologist, both hard consolidated formations (such as sandstone, limestone, granite, or lava rocks), and loose unconsolidated sediments (such as gravel, sand, and clay).
runoff	That portion of rainfall or melted snow which ultimately reaches surface streams. The portion which flows off the surface, without sinking into the ground, is called the immediate runoff; the part which sinks into the ground but eventually returns to the surface by seepage and from springs is called delayed runoff. Runoff is faster and greater during heavy rain than during protracted drizzle, on clay soils than on sandy soils, on frozen soils than on frostless soils, in treeless areas than in forests. The ratio between runoff and rainfall varies considerably with climatic conditions.
sanitary sewer	See sewer, separate.
scouring	The removal of earth or rock by the action of running water or of a glacier; in wool manufacture, the removal of foreign matter from wool by propelling it through a series of bowls and squeeze rolls by means of reciprocating arms; scouring wastes are the strongest polluting materials in the whole textile industry and the major factor to be considered in dealing with the waste problem at an integrated woolen mill.
screening	In waste treatment, the removal of solid waste materials from waste water by a screen.
sea level	The level of the surface of the sea between high and low tide, used as a standard in measuring heights and depths.
secondary clarifier (secondary settling tank)	In a waste-treatment plant, a basin or tank that receives liquid from a trickling filter or an activated sludge tank; here settleable solids are removed by sedimentation.
secondary wastewater treatment	See wastewater treatment, secondary.
sediment	Fragmental mineral material transported or deposited by water or air; the material that settles to the bottom of a liquid.

sedimentation	In water treatment, an early stage in the purification of raw polluted water whereby suspended particles in the water are allowed to settle.
sedimentation tank	See clarifier.
seepage	The slow oozing of groundwater out onto the earth's surface, as distinct from the more pronounced flow of a spring.
seiche	A short-term local oscillation in the surface of a lake or land-locked sea which may be caused by a persistent strong wind or a change in atmospheric pressure.
senescent lake	A lake nearing extinction, especially through the accumulation of the remains of aquatic vegetation. (See extinction, lake.)
separate sewer	See sewer, separate.
septic tank	A tank in which the organic solid matter of continuously flowing waste water is deposited and retained until it has been disintegrated by anaerobic bacteria.
settleable solids	In water or wastes, bits of debris and fine matter heavy enough to settle out.
settling tank (settling basin)	A tank (basin) in which settleable solids are removed by gravity.
sewage	See waste water.
sewage lagoon	A shallow pond, three to five feet deep, where natural biological processes purify waste water to a degree comparable to that accomplished in a secondary treatment plant. The organic matter is broken down into simple compounds by bacterial action; these decomposition products are utilized by algae in the course of photosynthesis to produce oxygen, as well as additional algal mass; the oxygen then constitutes the supply needed for aerobic bacterial decomposition. The load of total organic matter that a pond can assimilate depends on many factors. Shallow ponds (three feet) are more effective than deeper ones; those exposed to wind movements are more effective than sheltered ones; other

	critical factors are temperature and available sunlight, which vary with climate. Loads of 10 to 120 pounds BOD per acre per day have been recorded assimilated in such ponds.
sewage-treatment plant	See wastewater treatment plant.
sewage works	Wastewater installations, including both the sewer systems and the wastewater treatment plant.
sewer	A conduit to carry off water and waste matter.
sewer, collecting	A sewer that collects waste water from lateral sewers and connects to a trunk sewer.
sewer, combined	A sewer that carries both waste water and storm water. During dry weather the combined sewer carries all waste water to a treatment plant. During a storm, only part of the flow is intercepted, and the remainder goes directly into the receiving stream untreated.
sewer, intercepting	A sewer that catches waste water before it empties into a waterway, and transports it to a treatment plant.
sewer, lateral	A street sewer that serves a limited number of properties. Lateral sewers usually discharge into a collecting sub-main, main, or trunk sewer.
sewer, outfall	A sewer that carries waste water to a point of final discharge.
sewer, separate	A sewer that carries waste water but excludes storm and surface waters.
sewer, trunk	A sewer that transports waste water from collecting sewers to the treatment plant. A trunk sewer does not ordinarily service individual properties, but rather receives tributary branches and serves a larger territory.
sewer system	The system of sewers and related facilites for collection, transportation, and pumping of waste water.
sewerage	See sewage works.
silt	Unconsolidated sedimentary rock consisting of particles finer than sand and coarser than clay.

sludge — The solid matter removed from waste water -- a concentration of solids thick enough to give its fluid carrier a paste-like consistency. Sludge includes both organic matter, which can be burned, and other matter which can not. Municipal sewage, food processing, and chemical plants, refineries, and pulp and paper mills produce organic sludge. The noncombustibles are usually water-softener sludge, chemical precipitates, pigments, sand and slit, and miscellaneous debris.

sludge, activated — In waste treatment, sludge containing living organisms that multiply and in doing so reduce impurities in the waste water, thereby making good a deficiency of oxygen and removing odor and taste caused by destroyed bacteria.

sludge-digestion tank — See digester.

sludge-drying bed — A bed on which the humus-like residue from the digester is dried; after being dried the sludge may be burned or dumped.

sluice — An artificial passage for water, fitted with a valve or gate for stopping or regulating the flow; a regulating device for holding water back or letting it flow in or out; a conduit (natural or artificial) to drain or carry off surplus water; a long inclined trough or flume, usually on the ground.

slurry — A watery mixture or suspension of insoluble matter (such as mud, lime, wood pulp).

snowline — The line of elevation on a mountain or hill slope that marks the lower limit of perpetual snow; below this line, any snow melts during the summer. The altitude of the snowline varies considerably in different regions; in general it occurs progressively lower from the tropics to the polar regions. Its altitude depends largely on the summer temperatures, that determine the rate of melting. Another important factor is the total amount of winter snow; the snowline will be higher in a dry region than a wet region. A third important factor is exposure; the snowline will usually be higher on the southern than the northern side of a mountain. Furthermore, the snowline will be higher on a steep slope, where much of the snow descends as avalanches, than on a gentle slope, where most of it lies where it falls till it melts.

social costs and benefits	Considerations of long-range societal values at the regional or national level which might not be taken into account in the profit and loss statement of an individual farmer, forest operator, industrialist, or other private citizen.
soil moisture	Water diffused in the upper layers of the soil from which it is taken by plants for transpiration or from which it evaporates into the atmosphere.
solute	A dissolved substance, especially the smaller component of a solution.
solvent	A substance capable of or used in dissolving one or more other substances; the liquid component of a solution, present in greater amount than the solute.
sparging	Heating a liquid by means of live steam entering through a perforated or nozzled pipe (used, for example, to coagulate blood solids in meat processing).
specific conductance (of water)	Measure of a water's capacity to convey an electric current. This property is related to the total concentration of the ionized substances in the water and the temperature of the water. Most inorganic acids, which dissociate readily in aqueous solution, will conduct an electric current well, while organic compounds (such as sucrose and benzene), which do not dissociate in aqueous solution, will conduct a current poorly if at all.
specific yield (of water)	The amount of water that can be obtained from the pores or cracks of a unit volume of soil or rock.
sphagnum	A grayish moss growing in dense layers in bogs, that eventually forms peat.
spring	A continuous or intermittent flow of water from the ground.
SS	See suspended solids.
stablization pond	See sewage lagoon.
stage construction	In waste treatment, the building of wastewater treatment plants in steps, so that treatment units serving a small group of homes can be converted to other process uses and combined with additional treatment units as additional homes are built.

stagnant	Not flowing, and as a result deficient in oxygen.
stick	A thick residue remaining after processed tank water from a slaughterhouse is evaporated.
storm drain (storm sewer)	A drain (sewer) that carries storm and surface waters and drainage, but excludes domestic and industrial waste water other than nonpolluting cooling water.
stream	Water and rock waste streaming toward the sea along a more or less definite course. Each stream occupies a valley, excavated or modified by itself, of which it is an integral part. Most valleys are floored with rock waste deposited by their streams, and usually these partial fillings are saturated with water that percolates down-valley at rates much slower than the flow of the surface waters.
stream deposition	The laying down of solid materials carried by a stream, which may take the form of channel deposits, flood deposits, bars, spits, fans, or deltas.
strip-cropping (strip-farming)	The growing of separate crops in successive narrow strips that follow an approximate contour on slopes; such planting retards wind or water erosion.
strip-mining	Mining near the earth's surface by stripping the overlying strata from the ore bed (especially applied to coal mining near the surface).
structure, soil	The relation of particles or groups of particles in a soil, which imparts to the whole soil a characteristic manner of breaking. Soil-structure types include crumb structure, block structure, platy structure, and columnar structure.
suint	The dried perspiration of sheep, deposited in wool chiefly in combination with fatty acids and having a high potassium salt content.
sulfur bacteria	Bacteria that oxidize sulfur compounds, precipitating sulfur or producing noxious sulfur gases such as hydrogen sulfide. In this process they may cause damage to concrete or other structures.

sump	A depression or tank that serves as a drain or receptacle for liquids to be salvaged or disposed of (for example, a cesspool, an open drain for carrying off dripping liquids, or a depression in a water channel to facilitate the emptying of the channel).
surfactant (surface-active agent)	A substance useful for its cleansing, wetting, dispersing, or similar powers. Synthetic detergents contain surfactants.
suspended solids (SS)	Solids suspended in waste water. The amount of suspended solids is a measure of the strength of sewage.
sustained yield	The use of a renewable resource at a rate that permits resource regeneration for use continuing undiminished into the future (for example, timber cut so as to produce the same amount of wood each year; deer hunted without long-range damage to the herd).
swamp	A tract of low-lying land that is saturated with moisture and usually overgrown with vegetation. A marsh, unlike a swamp, is ordinarily covered with water; a bog, unlike a swamp, consists largely of decaying vegetation. The dampness of a swamp is due to some obstruction to normal drainage, because of the flatness of the land, the presence of impermeable rocks, or the growth of vegetation. A swamp is often formed in a lake basin as it fills up; because the surface is flat the rain water runs off very slowly, and the growth of vegetation in the damp soil helps maintain the swampy condition.
syncline	The trough or inverted arch of a fold in rock strata. (Compare anticline.)
synergism, pollution	The combined effect of two or more toxic substances acting together that is more adverse than their sum would be if each were acting separately or independently. (Compare antagonism, pollution.)
tailing ponds	Enclosures or basins constructed for the disposal of mine tailings (the fine rock waste in washings from mills after the grinding and processing of ores); they serve as settling basins and prevent or reduce the contamination of streams and other water bodies by such waste.
tannin	A plant substance often discharged as a waste of the tanning industry.

terracing (terrace cultivation) — A system of agricultural cultivation by which terraces are cut into mountain or hill slopes, and retaining walls to hold irrigation water and soil are built around the resulting small level patches. Such cultivation is common in mountainous areas where land is scarce or rainfall uncertain (for example, in India, China, and Japan).

territorial waters — The belt of sea adjoining a coast which is under the jurisdiction of the nation occupying the coast.

tertiary treatment — See wastewater treatment, tertiary.

thermal spring — A stream of warm or hot water issuing from the ground, often after having been heated by buried lava and therefore commonly occurring in volcanic regions when eruptions have ceased.

timberline — The line of elevation on a mountain or hill slope above which trees do not grow. Its height depends upon local as well as general conditions of climate and soil. It is lower in the temperate than in the tropical zone, lower on the shady than on the sunny side of a mountain, and highest on those slopes which provide the best protection from winds and the longest exposure to the sun.

toxic substance — A substance that either directly poisons living things or alters their environment so that they die. Examples are cyanides found in plating and steel mill wastes, phenols from coke and chemical operations, pesticides and herbicides, and heavy metal salts. Another broad group includes oxygen-consuming substances that upset the balance of nature, such as organic matter from food plants, pulp and paper mills, chemical plants, and textile plants. Still another group are sulfides, produced by oil refineries, smelters, and chemical plants.

transpiration — The process by which water vapor escapes from living plants and enters the atmosphere.

tributary — A stream that contributes its waters to a larger stream by discharging into it.

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trickling-filter process	In wastewater treatment, a process in which the liquid from a primary clarifier is distributed on a bed of stones. As the waste water trickles through to drains underneath, it comes in contact with slime on the stones, by which organic material in the water is oxidized and impurities are reduced.
trunk sewer	See sewer, trunk.
turbidity	An empirical measure of the optical property of the particles of mud, clay, silt, finely divided organic matter, or microscopic organisms suspended in water that interfere with light transmission, causing the light to be scattered and absorbed rather than transmitted through the water in straight lines.
unconformity	A lack of vertical continuity between layers of rock representing a gap in the geologic record.
underground water	All water beneath the surface of the ground, including both groundwater and vadose water, whatever its origin.
user charge (for water)	A charge for water based on the amount withdrawn from the public supply.
vadose water	Water that lies between the water table and the earth's surface.
volatile	Readily evaporable or vaporizable at a relatively low temperature.
waste water (sewage)	Water carrying waste from homes, businesses, and industries. It is a liquid mixture of water and dissolved and suspended solids.
wastewater treatment, conventional	Wastewater treatment including screening, sedimentation, coagulation, rapid sand filtration, and disinfection with chlorine.
wastewater treatment, primary	The first major (sometimes the only) treatment in a wastewater treatment plant. It screens out some sticks, rags, and other solids, and floats and settles out others in settling basins. At best primary treatment removes about 35 percent of the organic waste. A primary wastewater treatment plant may consist of the following units: bar screens or mechanical screens; grit removal chambers; flowmeters, comminutors or barminutors; clarifiers or sedimentation tanks, digesters or sludge digestion tanks; sludge drying beds; chlorinators or chlorine contact chambers.

wastewater treatment, secondary	Wastewater treatment using biological methods (bacterial action) in addition to primary treatment by screening, sedimentation, and flotation. In secondary treatment bacteria are used to destroy organic wastes as the water trickles over coarse stones. The process removes up to 90 percent of the dissolved pollutants, but leaves many other pollutants untouched. A secondary waste-treatment plant may consist of the following units, in addition to those of the primary treatment plant: trickling filter; aeration or activated sludge; secondary clarifier, secondary settling tank, final settling tank, and final settling basin.
wastewater treatment, tertiary	Wastewater treatment beyond primary and secondary treatment, which may consist of extensions or modifications of secondary treatment, additional forms of chemical treatment, electrochemical processing, carbon filtration, and other more complex procedures.
wastewater treatment plant	A plant that reduces the harmful and unstable elements in waste water so they can be disposed of without impairing other essential water uses.
water cycle	See hydrologic cycle.
water pollution control plant	See wastewater treatment plant.
water power	Energy obtained from natural or artificial waterfalls, either directly by turning a water wheel or turbine, or indirectly by generating electricity in a dynamo driven by a turbine.
water table	The top of the zone of saturation in which all rocks are saturated with water. The subsurface water that lies below the water table is called groundwater; that which lies between the water table and the earth's surface is called vadose water.
watershed	The boundary of an area from which water drains to a single point; in a natural basin, the area contributing flow to a given place or a given point on a stream. The watershed is increasingly coming to be regarded as a social and economic unit for community development and conservation of water, soil, forests, and related resources.

water-spreader	Any method of replenishing groundwater. The design and operation of a spreading systen are somewhat like those of an irrigation system, except that water is encouraged to percolate rapidly underground instead of being retained within the root zone of irrigated crops.
weathering	The mechanical, chemical, and organic decomposition of rock material under the influence of climatic factors--water, temperature change, and air.
weep hole (weeper)	A hole in a retaining structure to drain off accumulated water that might otherwise induce excessive pressure on the structure.
weir	A fence or enclosure set in a waterway for taking fish; a dam in a stream to raise the level of the water or divert its flow; a notch in a barrier across or bordering a stream to regulate the flow of water; a device for determining the quantity of water flowing over it from measurements of the depth of the water over the crest and known dimensions of the device (a cipolleti weir is a trapezoidal device of this sort).
weir basin (weir trough)	A wide approach to the upstream side of an irrigation weir constructed so as to minimize the effect of the momentum of the water flowing over the weir.
well	An underground source of water made accessible by drilling or digging to the level of the water table.
wet scrubber	In a steel plant, a giant cylindrical shower that removes the stubborn particles of raw material (mostly oxide) remaining behind when the heated air that reduces ore, coke, and limestone to molten iron in the blast furnace swirls up the stack. The dust-laden liquid is pumped to a giant settling basin in which the particles drop to the bottom in a thick sludge, permitting the cleared water to overflow the top of the basin and return to the stream.

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